REMARKS

Administrative Overview

The final Office action dated May 3, 2005, examined and rejected claims 39-83 under 35 U.S.C. § 102(e) as being anticipated by *Jacobus*. Applicants' undersigned representative engaged in a telephone interview with the Examiner on July 1, 2005. Applicants filed a Response After Final on July 5, 2005, and an Advisory Action issued on July 26, 2005. The amendments proposed in the Response After Final were entered, as indicated in the Advisory Action, but pending claims 39-58 and 60-83 were rejected.

Applicants amend independent claims 39, 60, 82, and 83 as reflected in the Listing of Claims to clarify that the haptic interface location is determined in response to a location of a user. Applicants also amend claims 42, 43, 46-49, 51, and 52 for stylistic purposes to replace the word "said" with the word "the." The amendments are supported in the originally-filed specification, for example, on page 2, lines 27-28, "[t]he haptic interface point represents the location of the user in the virtual environment," and at page 6, line 28, to page 7, line 10. No new matter is added.

Following entry of the amendments, claims 39-58 and 60-83 will be pending.

Applicants request reconsideration and withdrawal of the rejections in light of the following remarks, and Applicants request allowance of claims 39-58 and 60-83 in due course.

Claims 39, 60, 82, and 83 are not Anticipated by *Jacobus*

The final Office action dated May 3, 2005, rejects claims 39, 60, 82, and 83 under 35 U.S.C. § 102(e) as being anticipated by *Jacobus*. The Advisory Action maintains these rejections. Applicants respectfully traverse these rejections to the extent applicable to the claims, as amended.

The Advisory Action states the following:

> The virtual object in Jacobus has been interpreted to be the virtual three dimensional simulated environment... The interpretation relies on the user position and a relative or fiducial object location, wherein this relative location on the surface of the virtual object, the virtual environment[,] is the orientation of the user. Two distinct data items are used, wherein the user position and user orientation. User orientation relies on the fiducial or relative location on the surface of the virtual object. [emphasis added]

Applicants contend that the term "orientation" as it is used in *Jacobus* is incorrectly interpreted by the Advisory Action as a "location," and that, therefore, the foundation of the argument in the Advisory Action is improper.

Applicants respectfully submit that the term "orientation" is <u>not</u> a location (contrast "orientation" with recitation of "a haptic interface location" and "a fiducial object location" in each of the independent claims of the present application). *Jacobus'* interpretation of the term "orientation" is apparent at col. 12, line 18, in Figure 16 (P, R, Y – pitch, roll, yaw), and in Figure 3. In *Jacobus*, "orientation" indicates the way a user is oriented at a location in three-dimensional space (i.e. whether the user is upside-down, on her side, etc.). Orientation may be expressed in terms of degrees of pitch, roll, and yaw, as shown in col. 12, line 18, and in Figure 16 of *Jacobus*. As used in *Jacobus*, "orientation" is not a location; it is the way a user is oriented <u>at</u> a given location. For example, in *Jacobus*, a user located at point (X, Y, Z) may have orientation (P, R, Y) <u>at</u> the point (X, Y, Z).

Each of claims 39, 60, 82, and 83 recite calculating a force in response to (at least) <u>two locations</u> – (1) a haptic interface location and (2) a fiducial object location, where the fiducial object location is <u>on the surface of a virtual object</u>. *Jacobus* does not teach or suggest this limitation.

Jacobus states at col. 2 lines 57-60:

> According to the present invention, an electric signal is generated
> … as a function of [1] the user position and [2] orientation in
> three-dimensional space. [numbers in brackets added]

The force field generated in *Jacobus* is, "a function of the user <u>position</u> and <u>orientation</u> in three-dimensional space" [emphasis added]. Unlike the force recited in each of claims 39, 60, 82, and 83, the force in *Jacobus* is <u>not</u> a function of two locations – instead, it is a function of <u>one</u> location and the orientation of the user <u>at</u> that location. Thus, *Jacobus* is akin to vector field methods as described on page 2, line 23 to page 3, line 2, in the Background section of the present application:

> Vector field methods are a classification for any method that can
> determine the feedback force to be applied to a user by knowing
> only the location of the haptic interface point. …The haptic
> interface point represents the location of the user in the virtual
> environment. Vector field methods however, do not accurately
> replicate the touch sensations a user would experience for many
> objects in the real world. Users using a haptic interface system
> which utilizes a vector field method may experience force
> discontinuities when traversing the volume boundaries of the
> virtual objects.

The above-described limitations of the prior art are effectively overcome by Applicants' claimed invention that employs two locations, not a single location and orientation like *Jacobus*.

Moreover, "fiducial object location" is not the same thing as "haptic interface location" (although in certain instances the two locations may be coincident); that is, the fiducial object location is not simply the location of the user in the virtual environment. Applicants describe "fiducial object location" in the specification, for example, at page 6, line 28, to page 7, line10, a portion of which follows:

> The fiducial object location represents the location in graphic space at which the haptic interface <u>would</u> be located if the haptic interface could be prevented from penetrating the virtual objects. The fiducial object does not penetrate the surfaces of the virtual objects. ... When the haptic interface penetrates the surface of the virtual object, the fiducial object remains located on the surface of the virtual object. [emphasis added]

The fiducial object location provides for computation of a more realistic force, because it is used <u>in addition</u> to the haptic interface location to compute force. Contrast *Jacobus*, in which force is computed as a function of only one <u>location</u> – that representing the user.

Therefore, because *Jacobus* does not teach or suggest all of the limitations of any of claims 39, 60, 82, and 83, then these claims are patentable in light of *Jacobus*. Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. § 102(e) of claims 39, 60, 82, and 83.

Dependent claims 40-58 and 61-81 are not Anticipated by *Jacobus*

Claims 40-58 and 61-81 each depend directly or indirectly on either independent claim 39 or 60, and as such, each include all the limitations of their respective parent claim. Thus, claims 40-58 and 61-81 are allowable for at least the reasons discussed above with respect to claims 39 and 60. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections of dependent claims 40-58 and 61-81 under 35 U.S.C. § 102(e), at least on this basis.

Applicants reserve the right to respond to a rejection based on Massie, if presented in an Office action

The Advisory Action alleges the following:

> An interview summary and new PTO-892 have [been] attached, wherein the Applicant is referred to another prior art, which clearly calculates force and provides further examples of the use of virtual objects which represent real world objects and the use of user position and fiducial object position on the surface of the virtual object to determine force.

Applicants note that no formal rejection is presented based on the reference listed in the form PTO-892, that is, U.S. Patent No. 5,587,937 (*Massie et al.*). Applicants respectfully reserve the right to respond to a rejection based on *Massie et al.* should such a rejection be made.
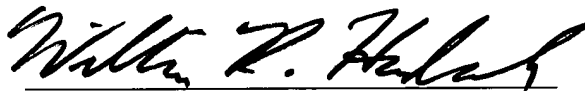
Applicants also note that *Massie et al.* and the present application are co-owned and have one or more inventors in common. Applicants further note that *Massie et al.* was pending at the time of filing of the earliest priority document of the present application. Finally, Applicants note that there is a co-owned case currently pending (U.S. Patent Application No. 10/990,226) that has not yet issued and that claims priority to the line of cases including *Massie et al.* Applicants respectfully reserve the right to distinguish over or disqualify *Massie et al.* as alleged "prior art."

Conclusion

Applicants request that the Examiner reconsider and withdraw the standing rejections in light of this Amendment and Response, and that the application be allowed. Applicants respectfully submit that all of claims 39-58 and 60-83 are in condition for allowance.

If the Examiner believes that it would be useful to discuss any aspect of the application by telephone, the undersigned representative cordially invites the Examiner to call at the telephone number given below.

Respectfully submitted,

Date: September 2, 2005
Reg. No. 53,002

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